10/039126

UNITED STATES PATENT AND TRADEMARK OFFICE

# CERTIFICATE OF CORRECTION

PATENT NO. : 6,784,476 B2
DATED : August 31, 2004
INVENTOR(S) : Kim et al.



It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

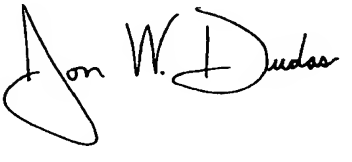
Title page
Title page illustrating figure(s) should be deleted, and substituted therefore, the title page illustrating figure(s). (attached)

Drawings
Delete drawing sheets 4, 8, 9 & 19, and substitute therefore, drawing sheets 4, 8, 9 & 19. (attached)

Column 9,
Line 64, delete "gale"and insert -- gate --.

Signed and Sealed this

Fifth Day of April, 2005



JON W. DUDAS
*Director of the United States Patent and Trademark Office*

(12) **United States Patent**
**Kim et al.**

(10) **Patent No.: US 6,784,476 B2**
(45) **Date of Patent: Aug. 31, 2004**

(54) **SEMICONDUCTOR DEVICE HAVING A FLASH MEMORY CELL AND FABRICATION METHOD THEREOF**

(75) Inventors: **Dong-Jun Kim**, kyunggi-do (KR); **Jin-Ho Kim**, San Jose, CA (US); **Yong-Kyu Lee**, kyunggi-do (KR); **Min-Soo Cho**, Kyunggi-do (KR); **Eul-Youl Ryu**, Daejeon-shi (KR)

(73) Assignee: **Samsung Electronics Co., Ltd.** (KR)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/039,126**

(22) Filed: **Jan. 3, 2002**

(65) **Prior Publication Data**

US 2002/0100926 A1 Aug. 1, 2002

(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**[7] ..... **H01L 27/108**; H01L 29/76; H01L 29/94; H01L 31/119

(52) **U.S. Cl.** ..... **257/296**; 257/314

(58) **Field of Search** ..... 257/296, 311, 257/315, 316, 314, 319, 320, 318, 336, 344, 408, 549, 550

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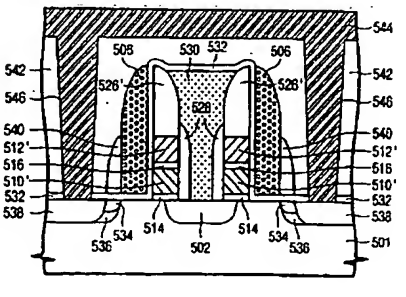
*Primary Examiner*—David Nhu
(74) *Attorney, Agent, or Firm*—Mills & Onello, LLP

(57) **ABSTRACT**

In a non-volatile semiconductor memory device and a fabrication method thereof, a charge storage layer is formed on a substrate. A control gate layer is formed on the charge storage layer. A gate mask having a spacer-shape is formed on the control gate layer. The charge storage layer and the control gate layer are removed using the gate mask as protection to form a control gate and a charge storage region.

15 Claims, 19 Drawing Sheets



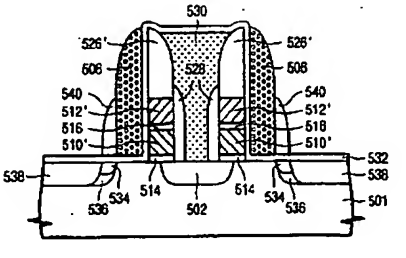



Fig. 5

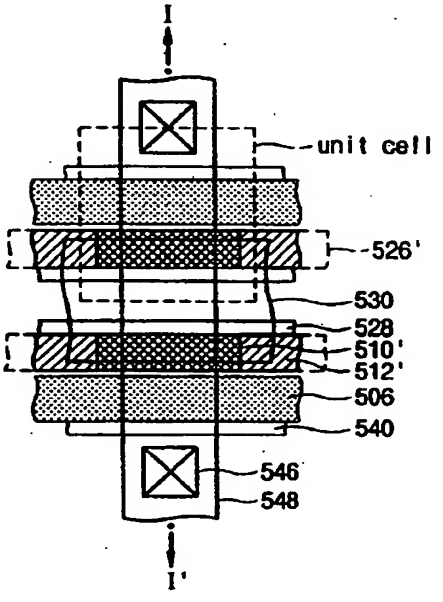

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Fig. 6

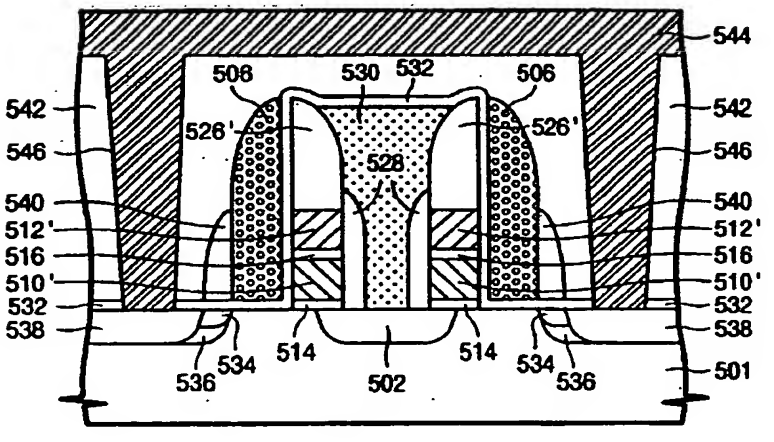
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Fig. 7G

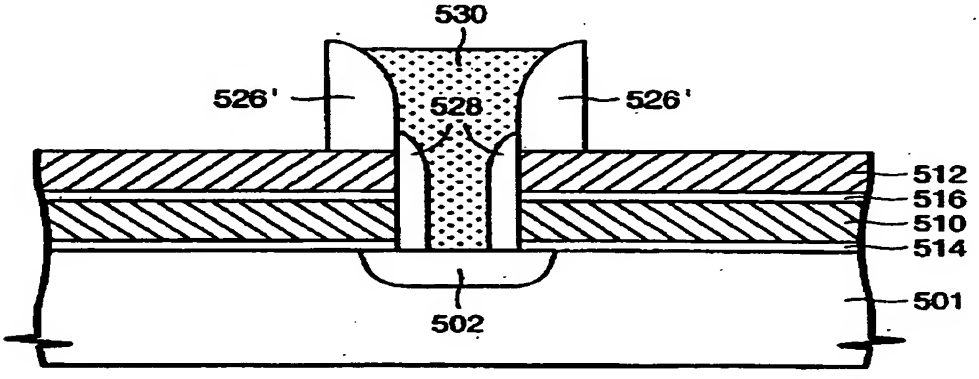
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Fig. 7H

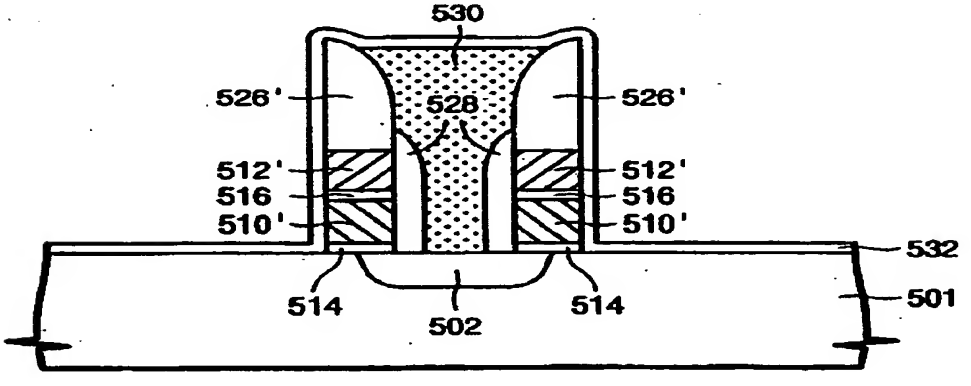
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Fig. 7I

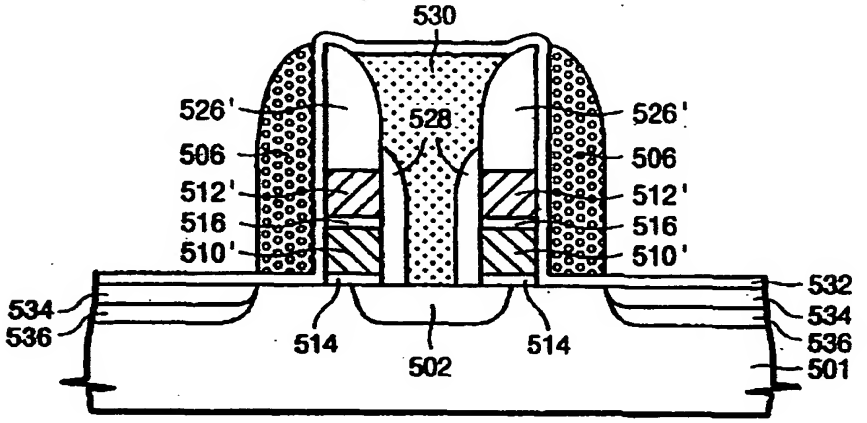
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Fig. 7J

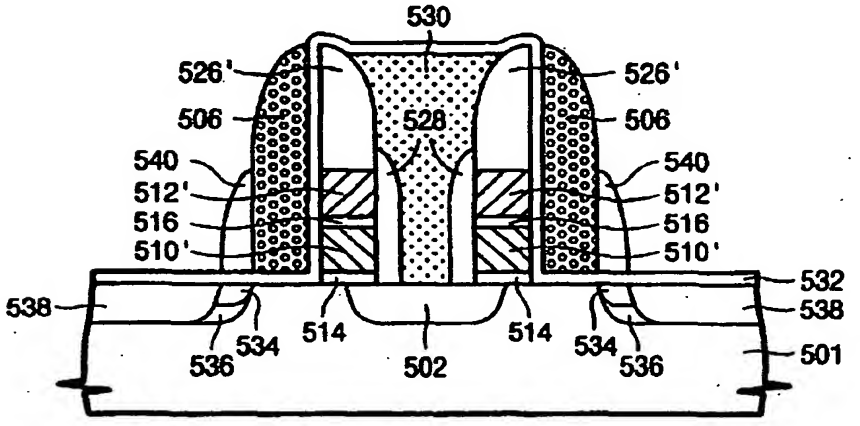
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Fig. 9I

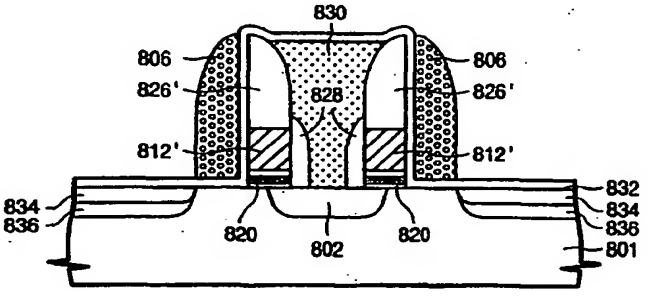
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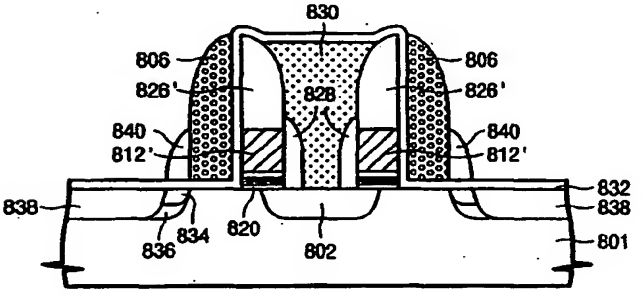
Fig. 9J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